The above are a few selected facts of interest, but the book will be found interesting even in a country where the orange is not commercially grown, and invaluable where citrus fruits are a staple industry.

CECIL H. HOOPER.

Lessons in Elementary Physiology. By Dr. T. H. Huxley. Enlarged and revised edition. Pp. xxiv + 604. (London: Macmillan and Co., Ltd., 1915.) Price 4*s.* 6*d.*

PROF. HUXLEY'S "Physiology" was a masterpiece; it first appeared in 1866, and since that date has been easily first among a crowd of elementary manuals. The edition which appeared before the present one was issued in 1900, and was then edited by Sir Michael Foster and Dr. Shore. It has been frequently reprinted since that date, but after a lapse of fifteen years the publishers have very rightly judged that it required revision in order to incorporate the new facts and generalisations which have been discovered in the meantime. This work has been entrusted to Mr. Joseph Barcroft, of Cambridge, and he has fulfilled his task with ability, tact, and, one may add, reverence. Although the repair has been substantial, one cannot but be struck with the fact how much of the fabric is left intact. There could be no better testimony to the thoroughness and permanence of the labours of the original builders. The main principles of physiological science remain for the most part unchanged. With some notable exceptions, recent physiological progress has been concerned with details, which are interesting enough to the researchers, but are really not essential from the elementary student's point of view. We wish the present edition every success and a continuance of usefulness.

W. D. H.

LETTERS TO THE EDITOR.

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of* NATURE. *No notice is taken of anonymous communications.*]

Remarkable Nest of "Vespa norwegica," and Fertility of Workers of this Species.

THE following observations on a colony of *Vespa norwegica* are perhaps deserving of record. About the middle of July a relative living at East Liss, Hants, endeavoured to take for me a nest of this tree-wasp, but was forced to beat a retreat after merely bending the branch of the rhododendron to which the nest was attached. The effect of this bend was to throw the nest permanently out of its original position, and to incline the combs within it at a considerable angle to the horizontal plane in which they had, as always, been built. On July 28 the nest was successfully captured, and forwarded to me, together with such of its inmates as happened to be at home at the moment of capture. The combs were five in number; the three upper were each of about four inches in diameter; the fourth smaller and of irregular shape, there being a patch of small, misshapen cells placed obliquely on one margin. The position of the fifth comb was very remarkable; it was attached, not to the fourth, but to the third comb; and, moreover, instead of hanging parallel to the other combs, it was set at a decided angle to them, the angle being such that it lay in the true horizontal plane, from which the others had been displaced. It is thus evident that the worker wasps are able to discriminate between oblique and horizontal positions with some nicety. This fifth comb had obviously been built since the disturbance of the nest; it consisted of but twenty-five small, though regularly hexagonal cells, and it is probable that the patch of irregular cells added to the edge of the fourth comb was of similar date, and represents an attempt to regain the horizontal plane for that comb. The queen had also been affected by the disturbance of the nest, for she had laid two, and frequently three, eggs in many of the cells of the second and third combs, instead of the normal one egg only. There were no eggs in any of the cells of the oddly-placed fifth comb, nor in the patch of irregular cells on the edge of the fourth. The absence of eggs from these cells points to all workers being sterile up to the time when the nest was taken. Within the nest as I received it were several dozen drones, two workers, and the queen; the majority of the workers must have been afield when the nest was removed.

On August 24 I visited the bush whence the nest was obtained, and found that the workers had continued operations, although bereft of their queen. On the ground immediately beneath the place of the original nest they had built an irregular mass of wasp-paper round some dead twigs of heather, and in the midst of this mass, smothered in the wasp-paper wrappings, was a very small comb consisting of six badly-shaped cells, of which two contained eggs that had failed to develop and had shrivelled. But fastened to a branch about a foot above this mass was a small nest of normal shape, and of about two and a half inches diameter, such as might be expected in early summer. Worker wasps were visiting both these structures, and occasionally one would emerge from the nest and proceed direct to the mass upon the ground, or *vice versâ*; both were clearly the work of the one colony. I caught all the wasps—only thirty-seven in number—and found them to be workers without exception. Inside the suspended nest was one small, but perfectly regular comb composed of forty-four cells, thirty-three of which contained larvæ of various sizes. None of these larvæ looked healthy or well nourished, and three of the largest were dead and had turned pink. There was no queen in the nest; hence it is certain that at least one of the workers must have become parthenogenetically fertile.

It is probably not unusual for workers to become fertile in strong colonies towards the end of a favourable season; but I am not aware that such clear proof of worker fertility has hitherto been obtained, and it is certainly singular that reproductive powers should arise in the circumstances above narrated.

OSWALD H. LATTER.

Charterhouse, Godalming, September 7.

An Original Representation of the Giraffe.

AMONG the interesting reproductions of early figures that Prof. Eastman has lately presented to the readers of NATURE are two of the giraffe—one (NATURE, February 18) from Ehrenberg's memoir published in 1834, and the other (July 29) from a manuscript in the British Museum. Both these figures are attributed to Thebes; the former, from a "monument," is shown with a monkey-like animal on the back of its neck, and the latter, from a "tomb," has the monkey in

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front of the neck. In both cases the giraffe faces towards the right, and there can be little doubt that they are efforts of our recent ancestors to try to copy an ancient picture.

G. A. Hoskins published his "Travels in Ethiopia" in 1835; consequently his animal figures are entitled to rank as early representations, though they were not done with zoological intent. A feature of the work is a series of colour-printed plates showing an expedition returning from the land of Punt, and among the figures appears to be the original of Prof. Eastman's giraffes. The accompanying illustration (Fig. 1), due to the skilled hand of Mr. W. Ashton, serves to show the delicate accuracy of Hoskins's copy, which must in its turn be very closely similar to the Egyptian painting. Attention may be directed to the prehensile lips, the form of the shoulders, and the tuft of hair at the end of the tail. The colouring of Hoskins's plate enhances the accuracy of the details. The giraffe is only an item, and, like the elephant in the same procession, is evidently a young animal, as it is only a little taller than the men in charge of it. The painting includes the leopard, hunting cat, ibex, dogs, cattle, and a curious bear-like animal, the portrait of which is probably as true to life as the others. Four distinct races are shown among the human figures who are carrying elephants' tusks, ostrich feathers and eggs, and skins of different kinds, as well as many other treasures from the southern lands.

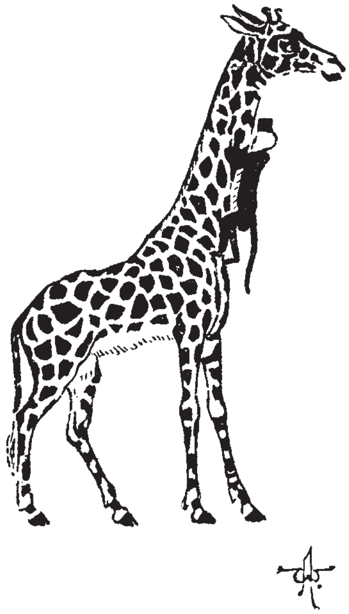

Fig. 1.—Illustration of giraffe. From Hoskins's "Travels in Ethiopia."

Hoskins states that the original painting was in a tomb of the time of Thothmes III., but excavation had not then proceeded far, and possibly the structure is what we now know to be the west terrace of Queen Hatshepset's temple of Der el Barhari. Here, according to Dr. E. A. Wallis Budge's description, there are bas-reliefs that must be very similar to, if not identical with, the painting copied by Hoskins. The expedition to Punt was a feature of Queen Hatshepset's reign, and occurred about 1600 b.c., while the association of Thothmes's name is accounted for by this gentleman's habit of substituting it for that of his predecessor.

G. W. Grabham.

Khartoum, August 21.

THE WORLD'S SUPPLY OF POTASH.

In view of the scarcity of potash occasioned by the war, the Imperial Institute has issued a pamphlet (pp. 47, price 1*s.*) under the above title, in which a review is given of the existing sources of supply and suggestions made as to the possibility of obtaining potash from materials not hitherto worked for this purpose. The potash used in this country has been almost exclusively derived from the Stassfurt deposits, south of Magdeburg, which have been so systematically and economically worked since about 1862, that German potash, on account of its cheapness, has driven all other competitors from the market. Potash salts are essential constituents of plant food, and the greater part of the potash salts extracted at Stassfurt is used as a fertiliser; but relatively large quantities are employed in various chemical industries and in the manufacture of glass and soap.

Besides the Stassfurt deposits, there is only one extensive deposit of carnallite at present known, and that is the Spanish deposit of Catalonia, the working of which, it is stated, has recently been commenced. This deposit has great commercial promise, and, next to those of Stassfurt, may prove to be the most important source of potash at present known. There are also deposits in India, which may prove to be of importance if they can be worked sufficiently cheaply.

All plants contain more or less potash, and the utilisation of the ash of wood, the ash of seaweeds, of beetroot residues, and similar by-products of industries in which vegetable raw materials are employed, is of importance as a source of potash, especially at a time of scarcity like the present. The burning of seaweed and the extracting of potash from the ash, at one time an important industry on the coasts of Scotland and Ireland, has recently shown signs of revival. From Ireland during 1913, 3939 tons of kelp, valued at 16,631*l.*, were exported. As a rule the Irish kelp contains more potash than that produced in Scotland. At the present time the utilisation of the giant kelps of the Pacific coast is regarded by many as the most promising source of soluble potash salts in the United States. The best account of the new industry which has sprung up on the Pacific shores was given by F. K. Cameron in a paper read before the Franklin Institute in 1913 (Journ. Franklin Institute, vol. clxxvi., p. 347). According to an official estimate 6,000,000 tons of potassium chloride could be obtained annually from this source. It was shown by Balch in 1909 that the giant algæ of the Pacific, the principal species being Nereocystis and Macrocystis, contain about five times as much potash as the majority of seaweeds, the average percentage on the dried weed being from 15 to 20 per cent. of K_2O. Since the publication of these results various labour-saving devices have been tried for cutting and collecting the weed, and the cost per ton of weed now landed is stated to be about 20 cents.

The preparation of potash salts and iodine has also become an important industry on certain parts of the coast of Japan, and it is stated that Japan now supplies about 80 per cent. of the iodine consumed in the United States. The weeds used on the coast of Japan are species of Laminaria, *Ecklonia cava, E. bicyclis,* and Sargassum, spp.

In Canada the burning of wood to ash was for several years a considerable source of potash, but

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